

What is claimed is:

1. A process for producing a decaffeinated coffee plant by genetic recombination comprising suppressing expression of at least one gene selected from the group consisting of a gene coding for xanthosine methyltransferase, a gene coding for 7-methylxanthine methyltransferase, a gene coding for 3,7-dimethylxanthine methyltransferase and mixtures thereof by an antisense method or an RNAi method.

2. A process for producing a decaffeinated coffee plant by genetic recombination comprising:

a step for preparing an antisense sequence or an RNAi sequence of a gene coding for an enzyme related to the caffeine biosynthetic pathway and constructing an expression vector for transformation,

a step for introducing the obtained expression vector into *Agrobacterium*,

a step for infecting a cell division-activated tissue piece of a coffee plant or a callus or an adventitious embryo induced from a tissue piece of a coffee plant with the *Agrobacterium* to transform the tissue piece, the callus or the adventitious embryo and

a step for obtaining a transgenic coffee plant from a transformed tissue piece, a transformed callus or a transformed adventitious embryo.

3. A process for producing a decaffeinated coffee plant as claimed in claim 2, wherein the enzyme related to the caffeine biosynthetic pathway is xanthosine methyltransferase, a nucleoside deribose emzyme, a 7-methylxanthine methyltransferase or a 3,7-dimethylxanthine methyltransferase.

4. A transformed coffee plant produced by the process as claimed in claim 1,2 or 3.